

## **REMARKS**

### **I. Status of the Application**

Claims 1-3, 6, 9-12, 20, 21, 24 and 27-29 are pending. This paper amends claims 1 and 6. No claims have been added or canceled. Hence, after entry of this paper, claims 1-3, 6, 9-12, 20, 21, 24 and 27-29 will stand pending for examination. Claims 1 and 12 are independent claims.

### **II. Claim Amendments**

Claim 6 has been amended to correct the recited claim dependency.

Claim 1 has been amended in response to the Response to Arguments section of the Office Action as set forth on pages 22-23. In particular, claim 1 has been amended to clarify that the conductive metal material of the shield is connected to the anode base and thus the shield in use is actually charged with the anodic potential and provides an electrostatic barrier as well as a mechanical barrier. This functional structure was previously presented in claim 12.

Applicant respectfully submits that the current amendment does not broaden the scope of claim 1. Applicant does not agree that the example cited by the Office action of a plastic shield with metal reinforcements attached through the plastic would have read on claim 1 as previously presented because such an embodiment would not reasonably be deemed to be attached “in an electric current conducting manner.” In applicant’s view, the non-conducting interpretation suggested in the Office Action reads the limitation “in an electric current conducting manner” out of claim 1. Nonetheless, in order to move prosecution forward and remove any possible ambiguity from claim 1, the foregoing amendment has been made.

Support for the amendment to claim 1 may be found in the English translation of the specification in at least the 3rd-6th paragraphs of page 4 and in claim 8 as filed.

### **III. Claim Objections**

Claim 6 is objected to because of an informality in the claimed dependence. Claim 6 has been amended to depend from claim 1.

## **II. Claim Rejections- 35 USC §103**

Claims 1-3, 6, 10-12, 20, 21, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usuda et al. (US 5,102,521) in view of Yang et al. (US 6,156,169) and Kovarsky (US 6,852,209).

In addition, claims 1-3, 6, 10-12, 20, 21, 24 and 28 are separately rejected under 35 U.S.C. 103(a) as being unpatentable over Day et al. (US 6,391,170) in view of Yang et al. (US 6,156,169) and Kovarsky (US 6,852,209).

The foregoing rejections of claims 1-3, 6, 10-12, 20, 21, 24 and 28 will be discussed together herein, with specific reference to the Usuda and Day references as required. These rejections are respectfully traversed, because the combined references cited in the Office Action do not teach or suggest each claim element of any claim. In addition, the combined references, even if they do possibly show each claim element, teach away from the claimed subject matter. Thus, the Office action fails to state a *prima facie* case of obviousness with respect to claims 1 and 12.

On pages 6 and of the Office action the following statement is made:

*“Please note, in interpreting the claim limitation requiring the shield to be connected to the anode base in an electric current-conducting manner under the broadest reasonable interpretation standard, the Examiner is treating the limitation of independent claims 1 and 12 as merely requiring the shield and the anode base to be connected in a manner which is capable of conducting current, i.e. either physically touching each other or in physical contact with an electrically conducting material.”*

Applicant has amended claim 1 to clarify that the conductive metal material of the shield is connected to the anode base such that the shield in use is actually charged with anodic potential. Thus, the configuration recited in claim 1 provides for the method limitation of claim 12, “...reducing material transport to and from the anode base through the action of the shield as an electrostatic barrier.” Applicant respectfully submits that the combinations of references cited by the Office Action do not teach or suggest at least these elements of claims 1 and 12.

In the Office Action, the Examiner argues that Usuda and Day both teach an anode comprising an anode base and a shield. Both references are said to not explicitly teach “a shield

comprising a conductive metal material or a conductive metal and plastic material, wherein the shield is connected to the anode base in an electric current-conducting manner.” To overcome this deficiency in the Usuda and Day references standing alone, the Office Action argues that Yang teaches titanium as a suitable material for use within plating solutions such that a skilled person would have readily recognized the use of titanium as suitable metallic shield material.

Applicant acknowledges that one skilled in the art might possibly be led to a metal shield by Yang or another reference. This possibility alone however is not sufficient to support the obviousness rejection. Most importantly, there is no suggestion at all in the combination of references cited in the Office Action that the metal shield be connected in a conductive manner to the anode base to provide an electrostatic shield. Applicant’s claims recite much more than the mere selection of a metallic material as suggested by the Office Action. On the contrary, Applicant’s claims recite a very specific connection between the conductive portions of the shield and the anode base such that the shield is charged to act as an electrostatic barrier. These specific limitations of claims 1 and 12 are not shown by merely pointing to the basket of Yang that happens to be made of a conductive material.

Usuda and Day both relate to an electroplating apparatus comprising an insoluble anode. According to Usuda, the insoluble anode is surrounded by a unit case 11 including diaphragm 31 and rib member 41. The rib member 41 is taught to protect the diaphragm from deformation and damage (Usuda, col. 4, line 36-37). Due to the design of the rib member 41 in a grid pattern, the mechanical strength of the entire insoluble electrode structure can be increased (Usuda, col. 5, line 58-60). According to Day, an insoluble anode is surrounded by an anode box 10 which is structured to protect and stabilize the anode plate and to isolate the anode from adjacent cathode plates and from a diaphragm in use (Day, col. 2, line 25-30). Thus, the intended purpose of the rib member 41 and associated structures of Usuda and the anode box 10 of Day are to increase the mechanical strength of the anode assembly and thus protect the diaphragm or anode, respectively. These structures, purposes and uses do not provide any hint that an electrical connection between the anode and shield providing an electrostatic barrier might be possible or advisable.

In summary, the Office Action appears to focus on the mechanical barrier aspect of the shield and overlooks the electrostatic barrier functionality of claims 1 and 12. See for example

page 8 and page 17 of the office action where the electrostatic barrier limitation of claim 12 appear to be ignored.

Furthermore, the combined references relied upon by the examiner appear to teach away from a charged electrostatic barrier as recited in claims 1 and 12. For example, Yang is directed to an electroplating apparatus comprising a soluble anode which is also referred to as metal supplier (Yang, col. 1, line 13-16; col. 1, line 38-40; col. 2, line 40-42). The soluble anode is surrounded by a titanium basket 52 which serves to contain the metal supplier and to connect it to the anode pole (Yang, col. 3, line 36-40). As shown in Fig. 4 of Yang, if the titanium basket 52 were capable of acting as a shield, the plating of a work piece 53 would be inhibited.

In addition, Usuda teaches that the increased mechanical strength imparted by the rib member and associated structures allows the insoluble anode itself to be designed in a thinner and therefore more light-weight manner which in turn, leads to a reduction of cost (Usuda, col. 4, l. 39-42; col. 5, l. 58 to col. 6, line 2). Taking into account the Examiner's opinion that Kovarsky suggests the use of platinized titanium as an insoluble anode, a skilled person would have had no motivation to use titanium as a material for the rib member 41 or the unit case 11 because in that case the extra use of titanium as rib member or unit case would be contrary to the desired reduction of weight and cost associated with the omission of titanium in the anode itself. In fact, in order to achieve the reduction of weight and cost effect as taught by Usuda a skilled person would have formed rib member 41 and unit case 11 from a material that is lighter and cheaper than the anode material. Hence, a skilled person would have had no motivation at all to further modify the anode arrived at by a combination of Usuda and Kovarsky by using titanium as a "shield material".

Furthermore, Day explicitly teaches the formation of the anode box 10 from polymer materials, such as polypropylene or PVC (Day, col. 3, line 1-4). Moreover, the anode box 10 is preferentially made by a molding process or formed by extrusion and milling techniques to be structurally sound to protect the anode plate (Day, col. 3, line 4-9). Thus, a skilled person would have refrained from using titanium as anode box material, in particular as the cost of titanium exceeds the cost of such polymers many times over.

Claims 2-3, 6, 10-11, 20, 21, 24 and 28 depend from claims 1 and 12 respectively and are believed to be allowable for at least the reasons set forth above.

For the reasons set forth above, Applicant respectfully submits the claims as filed are allowable over the art of record and reconsideration and issuance of a notice of allowance are respectfully requested. If it would be helpful to obtain favorable consideration of this case, the Examiner is encouraged to call and discuss this case with the undersigned.

This constitutes a request for any needed extension of time and an authorization to charge all fees therefore to deposit account No. 19-5117, if not otherwise specifically requested. The undersigned hereby authorizes the charge of any fees created by the filing of this document or any deficiency of fees submitted herewith to deposit account No. 19-5117.

Respectfully submitted,

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